CPC/CTB *Seminar*

11:00am-12:00pm, 12 November 2015

Climate Prediction Center/ NOAA Climate Test Bed Seminar Series

Speaker:
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Time:
11:00am-12:00pm, 12 November 2015

Location:
NOAA Center for Weather and Climate Prediction, Conference Room 2155
5830 University Research Court
College Park, MD 20740

Remote Access:
https://www1.gotomeeting.com/join/714576893
Meeting ID: 714-576-893
Conference call: 1-877-680-3341
Passcode: 858747

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Eastern Pacific Feedbacks and the Forecast of Extreme El Niño Events

ABSTRACT

We propose that extreme El Niño events, such as the ones in 1982-1983 and 1997-1998, are qualitatively different from the other events due to nonlinear feedbacks in the eastern Pacific, specifically the triggering of deep convection and the associated amplification of Bjerknes feedback. Evidence for this is provided by observations contrasted with the longer series from the GFDL CM2.1 coupled model. Similarly, we also propose that, although positive equatorial heat content anomalies are a necessary condition for such events, the presence of strong westerly wind stress anomalies in the central equatorial Pacific in boreal summer appears to have been both necessary and sufficient condition for extreme El Niño. This was particularly the case in 1982, when there was little prior indication that the event would grow fast late in that year and it appears that external wind forcing was key for kick-starting the event and allowing it to exceed the threshold for the amplified Bjerknes feedback.

Here we present preliminary results of an analysis of retrospective forecasts for the 1982-2010 period from by the models participating in the US National Multimodel Ensemble (NMME) project, specifically looking at the onset of the observed extreme El Niño, the role of convective nonlinearities in the eastern Pacific and random perturbations within the ensembles, and the effect of climate drift at different lead times. We also discuss the role of these processes and decadal variability on the forecast for the 2015-2016 El Niño event in the eastern Pacific.

Accelerate the transfer of research and development into improved NOAA operational climate forecasts, products, and applications.